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THE OCCURRENCE IN BRITISH COLUMBIA OF AN EARWIG SO-FAR UNRECORDED IN CANADA.

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As far as available records show, the Seaside Earwig, *Anisolabis maritima*, has not so far been taken in Canada. It is of interest therefore, to report having found this insect in considerable numbers on a small island 3 miles out from Departure Bay, Nanaimo, and on the mainland of Vancouver Island just near the Biological Station. It was discovered the end of last May in coarse gravel at high-tide mark, living in a narrow belt some 2 feet wide where the water had deposited a strip of seaweed and flotsam. The insects seemed restricted to this narrow, damp belt, hiding under logs or masses of dead seaweed or burrowing down into the gravel.

At first I thought they must be a Japanese species because Japanese fishing vessels ply out from the Bay and the houses and wharves of the fishermen are close by and from these wharves a great trade in herrings is carried on with the Orient: later it occurred to me that they might be *A. maritima* though that insect has so far been reported only from the Atlantic Coast States. Dr. Morgan Hebard of Philadelphia has kindly identified them and he assures me that they are *Anisolabis maritima* and that he has records of their distribution from several points in the States bordering the north Pacific, and from Japan.

Apparently this makes the 5th earwig to be recorded in Canada and it is certainly the largest. Species hitherto recorded are:—

1. *Labia minor* Linn. 4.5 mm. From Salmon Arm, B. C. and from Vancouver Island. This may be an indigenous species.
2. *Doru aculeatum* Scudd. 7.5 to 11 mm. From Toronto. This is probably an indigenous species.
3. *Euboriella annulipes* Lucas. 9 to 10 mm. From Vancouver Docks. An alien.
4. *Forficula auricularia* Linn. and variety *forcipata* Steph. 16 to 18 mm. An alien and a pest of rapidly increasing importance.

All of these are much smaller than the Seaside earwig, of which large females measure 30 mm. exclusive of the forceps...a full 10 mm. longer than is recorded for this same insect on the Atlantic coast. Apparently the conditions it finds in this Province, suit it admirably.

During July I kept some of these insects in a gem jar of gravel and seaweed, moistened regularly with sea water, and made a few observations on them. They form excellent material for dissection and their internal anatomy is as nearly a Type, to demonstrate to students, as one could wish for. They are nocturnal and as far as I can find out, they feed on seaweed. The female is readily distinguished from the male by its long, pointed forceps and larger size. The forceps of the male are bluntly recurved like bison horns. Females especially, use the forseps defensively. From a large female dissected in June, I obtained a very small Tachinid larva. It is distinctly commendable of these insects to bring

with them, where ever they came from, their own particular parasite. It is possible, however, that a native species of Tachinid is attacking them, though I could not find any flies on the shore at any time. Eggs were laid in July and the females exhibited the typical earwig care of them—stroking them all over with the palpi and carrying them from one side of the brood chamber to another. In fact this stroking and shifting seemed continuous and made me wonder if the eggs would not be glad of a rest. It is possible, however, that this manipulation...or should it be called palpipulation... is necessary for the hatching of the eggs. In October I returned to Nanaimo and paid a flying trip to the earwig beaches. Large females, such as were common in summer, were quite rare; large males could not be found. About three quarter grown specimens of both sexes were quite common and very small ones were abundant. The total earwig population in October far exceeded that of mid-summer, but their range on shore had not increased at all; they still occupied only the Orchestia or Amphipod line of high-tide mark and still occurred only in small detached areas in this line. The shore is broken and very rocky so perhaps if long stripes of coarse gravel such as these insects frequent, were available, their range might be greater than it is. So far I have found them only in two places, each some 30 yards long, and nowhere else in the neighborhood. On account of this restricted habitat, I doubt if they will become sufficiently abundant to develop into a pest, although in one instance only, did I happen to find one under a plank on a dry slope 30 yards from the sea. They cannot survive if the gravel in which they live is allowed to dry out even for 24 hours, so I am at a loss to account for this lone one so far from water.

As time permits, further observations are being made on this earwig, parallel with an intensive study of *F. auricularia* which is so abundant and so obnoxious in this vicinity. The results of this study will be published next year.

NOTES ON NORTH AMERICAN EPHEMEROPTERA WITH DESCRIPTIONS OF NEW SPECIES.*

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EPHEMERINAE

Ephoron leukon Will.

After a study of the original article (1802, Trans. Am. Phil. Soc., v. 71) I can see no reason why both generic and specific names should not be accepted as valid under the International Rules of Nomenclature. *Ephoron* Will. will supersede *Polymitarcys* Eaton as there seems little doubt, from Williamson's account of the habits of the "White Fly," that he was dealing with a species of this genus; this was already surmised by Hagen (1863, Proc. Ent. Soc. Phil., II, 171) who considered *album* Say as probably synonymous with *leukon* Will. With this latter reference I cannot agree; Say's description of *album* from the "Winnipeek River" Manitoba, calls for a thorax "slightly tinged with pale yellowish brown." Such an insect is before me in numbers from various localities in Manitoba, also from Northern Illinois, Cincinnati, Ohio, and Pullman, Wash. *Leukon* Will. is stated to possess a fuscous thorax and a species agreeing with this description

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

occurs in countless numbers in August on the Gatineau River about 15 miles north of Ottawa; there are also specimens before me from Columbus, Ohio, and Oswego, N.Y. In other respects the two forms are very similar but the thoracic coloration is so constant and distinctive that I am retaining both Williamson's and Say's names. Wih regard to *puella* Pict., described from a female (? subimago) from New Orleans which should be in the National Museum at Paris, I am inclined to think that Eaton's original reference of the species to *Campsurus* (1871, Trans. Ent. Soc. Lond., 58) is more likely to be correct than his later one (1883, Mon. 47), following Hagen (1873, Trans. Ent. Soc. Lond., 391), as a synonym of *album* Say. In Pictet's figure the abdomen shows three setae, it is true, but the fact that it remains uncolored indicates that the original specimen was probably without abdomen; the central projection of the prothorax, as noted both in the figure and the description, certainly points to *Campsurus*, as does also the southern locality. Until such time as it is possible to examine the type (if still extant) or until extensive collections have been made in the vicinity of New Orleans, I shall place *puella* in *Campsurus;* there is a possibility that it may prove identical with *primus* McD.

Pentgenia vittigera Wlk.

I think that Needham is probably correct in making *quadripunctata* Wlsh. a synonym of *vittigera* (1920, Bull. U.S. Bur. Fish., XXXVI, 282); the degree of distinctness of the four black dots on the fore wing seems decidedly variable and the same may be said for the outline of the lateral edge of the dorsal dark stripe, these being the only two characters on which Walsh separated his two species.

There appears, however, to be another species in the Ohio river which I describe herewith.

Pentagenia robusta n. sp.

Differs from *vittigera* as follows; the eyes are slightly larger and the general appearance robuster; the brown of thorax and dorsum of abdomen is deeper and shinier, this color on prothorax being extended so as to leave only a narrow lateral margin of yellow; the pro-, meso-, and metasterna are also largely brown and the pleura are tinged with the same color. Ventrally the abdominal segments show broken, brown, lateral lines, much as in *Ephemera* and the last two segments are considerably shaded with brown. The setae are distinctly brown (not pale yellow) with narrow pale intersegmental rings and the forceps are tinged with the same color. The fore tibiae and tarsi are light brown, darker at the joints. The forewings show no traces of black dots and the veins and crossveins are distinctly pale brown, noticeably darker than in *vittigera.*

Holotype—♂, Cincinnati, Ohio, (A. Braun); No. 1871 in the Canadian National Collection, Ottawa.

Potamanthus verticis Say.

Syn. *flaveola* Walsh, 1862, Proc. Acad. Nat. Sci. Phil., 377.

This species was treated by Eaton (Mon. p. 278) as an *Ecdyonurus,* evidently following an identification by Hagen. A comparison of the description with the original one by Say shows an obvious misidentification on Eaton's part, who probably had before him specimens of a species in the *pulchellus* group. Banks' idea of *verticis* (1910, Can. Ent., XLIII, 201) is just as unsatisfactory

and cannot be made to fit Say's description.

After a careful study of Say's diagnosis I find that the species heretofore listed as *Potamanthus flaveola* Walsh is the only one which satisfactorily complies with the characters given. Say evidently had a female before him and I would call particular attention to the following points: "Body yellowish white; vertex ferruginous; wings with the nervures (? crossveins) black; anterior thighs ferruginous at tip; setae hardly longer than the body." This last statement alone clearly shuts out all reference to the Heptageninae. The synonymy will therefore be as given above.

Myops Wlsh., at present listed under Ephemera, also belongs in this genus; I have examined the lectotype at Cambridge, Mass., one of the orginal lot sent by Walsh to Hagen. The species is larger than *verticis* (*flaveola*) with eyes wider apart and in the female sex with no trace of black on the crossveins. The male genitalia of the two species are very similar. Needham (1920, Bull. U. S. Bur. Fish., XXXVI, 287) states that only two species (*flaveola* and *diaphanus*) occur in North America. He has evidently overlooked the fact that he himself (1909, Rep. N.Y. State Ent., XXIV, 74) described another species, *inequalis*, from Schenectady, N.Y., which from the details given must be very close to, if not identical with, *myops* Wlsh.; I have, however, as yet had no opportunity of examining the type specimen. Banks also described a further species, *medius*, from Kansas (1908, Trans. Am. Ent. Soc., XXXIV, 259) which is only known to me from the two female types.

Verticis occurs in southern Ontario (Bothwell, Niagara Falls) and *diaphanus* must also be found in Canada as it was described from material captured at the Niagara River; the species is, however, as yet unknown to me.

BAETINAE

Ephemerella tibialis McD.

I have received what I believe to be the female of this species from Slave Lake, Alberta, (Aug. 17, O. Bryant). Both sexes show a great prolongation of the axillary cords, which project beyond the mesoscutellum fully 1 mm., a fact that was not noted in the original description of the male; the female abdomen is not noticeably pale-banded but the wing venation is dark, as in the male sex; the head shows a slight pale central shading.

Ephemerella coxalis n. sp.

Male. Eyes (dried) ruddy brown; head between eyes yellow; thorax brown, this color becoming brighter on the posterior portion of mesonotum; pleural sutures shaded with yellowish. Abdomen dorsally with the first seven segments pale yellowish heavily mottled with light brown and blackish; on segments 1-4 this mottling is so heavy that only irregular centrodorsal patches of pale color are left and even these are frequently obscured on segments 3 and 4; each pale patch contains a central black dash or spot, the remnant of a mediodorsal stripe, and is bordered by a blackish subdorsal shade; on segments 5-7 the pale dorsal area is considerably extended, the dorsal streaks are lacking, but the subdorsal ones show up plainly on the pale background; the lateral area contains irregular black blotches. All the segments show oblique black spiracular streaks, surrounded by a pale area. Segments 8-10 are light brown with small subdorsal

black spots on anterior margins and lateral dark streaks or spots. Beneath pale whitish ochre, shaded with light brown on segments 1 and 9 and with brown medioventral ganglionic patches; forceps and penes pale, slightly shaded with brown. Setae white. Legs rather bright yellow with two black spots on the coxa and one on each trochanter and femur, situated apically and most evident on the two posterior pairs of legs. Fore tibiae rather more than twice the length of the femur and about equal in length to the first two joints of the tarsi. Wings hyaline with pale venation.

Female. Paler than the male but similarly marked. Head pale yellow marked slightly with black. Length of body 7 mm.; of forewing 7 mm.

Holotype—♂, Dorval, Que., June 20, (F. P. Ide); No. 2070 in the Canadian National Collection, Ottawa.

Allotype—♀, St. Annes, Que., June 24, (F. P. Ide).

Paratypes—1 ♂, 1 ♀, Chateauguay, Que., June 18; 1 ♂, 2 ♀, Beauharnois, Que., June 19; 1 ♂, Dorval, Que., June 20; 2 ♂, 1 ♀, Lachine, Que., June 20, 23; 1 ♂, 3 ♀, St. Annes, Que., June 24; 2 ♂, 1 ♀, Coteau du Lac, Que., June 25.

The species belongs in the *bicolor-lutulenta* group and has very similar male genitalia. It is easily recognized by the black spots on the legs and the peculiar mottled appearance of the abdomen.

Ephemerella inflata n. sp.

Male. Head and thorax shiny blackish, the pleura below wings and the lateral portions of the mesosternum slightly tinged with dull olive-brown; axillary cords not produced beyond scutellum.

Abdomen dorsally almost unicolorous black-brown with traces of a narrow pale medio-dorsal line on anterior segments; ventrally paler, dull olive-brown. Forelegs with femur and tibia deep brown and about equal in length, coxa slightly tinged with olivaceous, tarsi paler, dirty white, the second joint longest, relative lengths of joints, 40; 43; 20, 23, 12, 5; mid and hindlegs pale olive-brown, the femora with an indistinct ruddy centro-dorsal streak; hind femur about equal in length to tibia and tarsi combined (35:25:10). Setae dirty white. Forceps with second joints inflated at both ends and strongly constricted in the middle, third joint fully three times as long as broad; penes united nearly to their tips, where they expand slightly and show a slight median v-shaped excavation. Wings hyaline with pale veins and crossveins. Length of body 6 mm.; of forewing 6 mm.

Female. Rather paler than the male, with considerable yellow shading laterally on the thoracic segments. Head largely red-brown, paler next the eyes and shaded with black-brown in the region of the ocelli; subanal plate pale, whitish yellow, rather short and broadly truncate apically.

Holotype—♂, Wakefield, Que., July 13, 1925 (F. P. Ide), No. 1951 in the Canadian National Collection.

Allotype—♀, same locality, July 28, 1926 (G. S. Walley).

Paratypes—4 ♀, 11 ♀, same locality, July 28, 1926 (F. P. Ide and G. S. Walley).

The genitalia show great similarity to those of *Drunella grandis* Eaton as figured by Dodd (1923, Trans. Am. Ent. Soc., XLIX, Pl. VIII, fig. 2); the species is, however, much smaller and with the normal venation of *Ephemerella;* it falls into the *fuscata* group.

Ephemerella flavilinea n. sp.

Male. Head, thorax and abdomen deep ruddy brown, the ventral surface of abdomen ruddier than the dorsal portion; a pale yellow line along the lateral flange, tending to spread upward along the segmental incisures, especially in the posterior segments. Fore femora and tibiae deep black-brown, the latter about one and one half times the length of former; fore tarsi somewhat longer than the tibia and distinctly paler, being dull dirty white, the first three joints subequal. Mid and hind legs dull yellowish, the femora marked with a ruddy brown apical patch on inner side. Setae blackish at base, paler outwardly. Wings hyaline with pale venation. Length of body 6.5 mm.; of forewings 8 mm.

Holotype— ♂, Waterton Lakes, Alta., July 26, (J. McDunnough); No 1945 in the Canadian National Collection, Ottawa.

The species belongs in the same group as the preceding and the genitalia are very similar to those of *coloradensis* Dodds (1923, Trans, Am. Ent. Soc., XLIX, Pl. VIII, fig. 4); it is however only half the size and is further distinguished by its ruddy venter and pale venation.

Ephemerella rotunda Morg.

Through the kindness of Prof. J. Needham I have been enabled to compare nymphs and female subimagos of this species and of *feminina* Needh. (1924, Psyche, XXXI, 309) and believe them identical, an opinion in which Prof. Needham concurs. The species is only known in the female sex; what appears to be this form is quite common in the Ottawa district and here, too, I have never been able to secure males although diligent search has been made. Judging by the smooth head of the adult and the shape of the subanal plate, the species falls into the *excrucians* group.

Baetis akataleptos n. sp.

Male. Turbinate eyes small, oval, dark red-brown (dried); thorax black-brown, abdomen with segments 2-6 semitranslucent, dull brown, shading into brighter, opaque brown on posterior segments; legs pale smoky, shading into whitish on tarsi; setae whitish. Wings hyaline with pale venation; costo-apical crossveins of primaries few in number and poorly developed, without granulations; no intercalaries in first interspace; secondaries long and narrow with prominent costal projection, and only two veins, vein 3 being absent. Length of body 2.5 mm., of forewing 3 mm.

Holotype— ♂, Medicine Hat, Alta., Aug. 14, (F. S. Carr); No. 2215 in the Canadian National Collection, Ottawa.

Paratype— ♂, same data.

This tiny species may be separated from the allied *pygmaeus* and *harti* by the dark anterior segments of the abdomen; the ♂ genitalia are similar to those of *pygmaeus* but between the bases of the forceps there is a projecting penis-cover, very finely setose, which is lacking in *pygmaeus*.

Baetis thermophilos n. sp.

Male. Head and thorax shiny blackish; abdomen dorsally dark olive-brown shading into brighter brown on the opaque posterior segments and with narrow pale rings on the posterior margins of the first six segments; ventrally pale ochreous. Legs smoky brown, the tarsi paler; forceps dusky at base with the two apical joints whitish, the last joint being long and narrow and almost

equaling the preceding one in length. Wings hyaline with pale venation; 7-8 well-developed costo-apical crossveins without granulation; secondaries long, narrow, with rather short blunt costal projection and three longitudinal veins, vein 3 being of equal length to the other two and running close to the inner margin for the full length of the wing; a single intercalary between 2 and 3. Length of body, 3.5 mm, of forewing 5 mm.

Holotype—♂, Old Faithful Geyser, Yellowstone National Park, Wyo., Sept. 3, (N. Criddle); No. 2216 in the Canadian National Collection, Ottawa.

The peculiarly long third vein of secondaries distinguishes the species at once from all other North American species.

Centroptilum semirufa n. sp.

Male. Head below the antennae pale yellowish, vertex brown, tinged with ruddy around the ocelli. Eyes (dried) red brown, appearing as flat disks, and not shrivelled longitudinally as is usually the case with species of the genera *Centroptilum* and *Cloeon*. Thorax olivaceous brown, mesonotum paler along lateral edges anterior to wing bases, the posterior portion (scutellum) is white with slight ruddy tinges anteriorly; metanotum with pale anterior edge which is tinged strongly with ruddy in central area. Mesosternum pale yellowish, the lateral flanges and most of the pleura brown, with small pale areas at the bases of the legs. Abdomen with segments 2-6 dorsally shaded strongly on the posterior half to three quarters with ruddy-brown, leaving on segments 2 and 3, more or less, the entire anterior half of segment pale hyaline, whilst on 4-6 this area is narrower and divided by a fine oblique shade of brown color into a large, pale, dorsal patch and a similar-colored one on latero-anterior margin; segments 7-10 dorsally entirely opaque ruddy-brown. Ventrally segments 2-6 entirely hyaline, segments 7-9 opaque whitish, with slight ruddy tinges laterally. A faint broken black stigmatal line. Forceps and setae white. Legs whitish yellow, with faint ruddy streak along dorsal edge of femora in median area. Wings hyaline with pale venation; costo-apical crossveins of primaries 3-4 in number, first crossvein of radial sector situated slightly proximad of second crossvein; hindwings narrow with the usual two longitudinal veins and a strong costal projection near base. Length of body 4 mm.; of forewing 4 mm.

Holotype—♂, Kearney, Ont., Aug. 6, (F. P. Ide); No. 1789 in the Canadian National Collection, Ottawa.

Paratype—1 ♂, same data.

The species is a rather fragile one and should be readily recognized by the white scutellum and the broad ruddy abdominal shade-bands.

Centroptilum album n. sp.

Male. Head black-brown with whitish ochreous tinges medially behind the ocelli; eyes dull orange-brown (dried). Pronotum blackish with paler lateral patches; mesonotum pale ochreous shaded with brown, the scutellum and posterior portion being almost entirely white with faint pink shades; metanotum deep brown, the anterior margin white, shaded with pinkish and with a median dark dot; sternum and pleura largely deep brown with slight white shading on the sutures. Abdomen with segments 1-6 entirely hyaline, segments 7-10 opaque whitish. Setae and legs white. Wings hyaline with pale venation; secondaries

very narrow, as in *fragile* McD., but hardly as long, with prominent costal projection.

Female. Head olive-ochre with a red-brown V-shaped mark medially behind the ocelli. Mesonotum light olive-ochre, paler posteriorly, as in the male; mesosternum and pleura similarly colored with considerable purple-brown suffusion on pleura. Abdominal segments 2-6 dorsally light yellowish with small purple-brown spots medially; laterally almost the entire area is covered with large purple-brown blotches, except on the fourth segment where the blotches are reduced to triangular patches on anterior margin and the yellow ground color is more evident; segments 7-10 pale ochreous with broken purplish median line and small latero-anterior blotches; ventrally all segments are pale ochreous with a row of brown dashes along each lateral edge and slight traces of ruddy on posterior margin of each segment. Legs and setae whitish, wings hyaline with pale venation. Length of body 4 mm., of forewing 4 mm.

Holotype—♂, Silver Creek, Orillia, Ont., June 13, (C. H. Curran); No. 1790 in the Canadian National Collection, Ottawa.

Allotype—♀, same locality, June 11, (J. McDunnough).

Paratypes—9♂, 14♀, same locality, June 11-13, (J. McDunnough and C. H. Curran).

A single female is before me from St. Annes, Que., (at the mouth of the Ottawa river), June 24, F. P. Ide, which appears to belong to this species.

Cloeon minor n. sp.

Male. Head and thorax deep black-brown, anterior edge of metathorax tinged with purplish; pleura and sternum mostly dark with slight ruddy tinges anterior to the wing bases. Abdomen with segments 2-6 dorsally hyaline, with geminate purplish brown dorsal dashes on each segment and large similarly colored lateral blotches which on segments 3 and 6 coalesce dorsally, leaving only traces of hyaline on anterior portion of segments; segments 7-10 opaque, deep brown with slight purplish tinges. Ventrally segments 2-6 hyaline with row of brown patches along lateral edge and the posterior edge of each segment marked with two transverse blackish dashes, one on each side of the median line; segments 7-9 opaque, light creamy brown with purplish shading on the posterior margin of the ninth segment. Forceps and setae pale. Legs whitish with traces of a ruddy spot on the middle of the femora. Wings hyaline with pale veins and crossveins; first crossvein of radial sector considerably nearer base of wing than the following crossvein. Length of body 3 mm.; of forewing 3 mm.

Holotype—♂, Joe Lake, Algonquin Park, Ont., Aug. 7, (F. P. Ide); No. 1791 in the Canadian National Collection, Ottawa.

Paratypes—6♂, same data.

The small size and the brown blotches on the abdomen distinguish the species at once from other described North American species.

Siphlonurus luridipennis Burm.

At my request Dr. G. Ulmer of Hamburg instituted a search for the type of this species which has always perplexed workers in the group and has heretofore been referred to the genus *Heptagenia*. Dr. Ulmer has recently informed me that he has located the type in the Zoological Institute of the University of

Halle; it is a female belonging to the genus *Siphlonurus* and was collected by Zimmermann in Carolina. I have been unable to match the excellent description drawn up and forwarded to me by Dr. Ulmer with any of our other *Siphlonurus* species, and the matter of identity must remain in abeyance until it is possible to study a good collection of material from the type region.

HEPTAGENIINAE

Ecdyonurus mediopunctatus n. sp.

Male. Close to *pulchellus* Walsh; head, anterior to ocelli, pale, whitish; vertex of head sepia-brown tinged with ruddy next the eyes. Thorax, both dorsally and ventrally, deep black brown with the exception of a whitish patch on the pleura anterior to the base of primaries and some slight pale shading below wing-bases; the mesonotum shows faint paler shading on the posterior portion of the scutellum and anterior to this a small whitish median dot and two small white lateral streaks. Abdomen with segments 2-7 white, hyaline, with scarcely a trace of dark posterior borders but with a small dark transverse dash in the median line in the hind margin of each segment and black stigmatal dots on segments 4-7 (sometimes obsolete); segments 8-10 opaque, whitish with light sepia brown shades dorsally on posterior half of 8 and on 9. Setae pure white (not banded as in *pulchellus*); forceps and legs whitish, the femora banded in the middle with purplish and tipped with the same color; apex of fore-tarsus black-tipped; first fore tarsal joint more than half as long as the second. Wings hyaline, with fine black veins and crossveins, the latter slightly thickened in the costo-apical area. Length of body 9 mm.; of forewing 10 mm.

Holotype—♂, Walsh, Ont., July 10, (G. S. Walley); No. 2228 in the Canadian National Collection, Ottawa.

Paratypes—2 ♂, same data: 2 ♂, Victoria Harbor, Ont., June 14, (C. H. Curran).

The Victoria Harbor specimens were reared from subimagos which were quite pale whitish in coloration.

The species belongs in the *pulchellus* group but can be distinguished by the very dark thorax in the male which lacks the prominently white scutellum of *pulchellus* and also by the single small dark streak on the mediodorsal line of the abdomen. The crossveins of the primaries are much finer than in *pulchellus*.

Ecdyonurus bipunctatus n. sp.

Male. Closely allied to *pulchellus* Wlsh. Head, anterior to ocelli, pale, whitish; vertex of head olive-brown to ruddy brown. Thorax dorsally dark sepia-brown, most noticeably on posterior portion and on lateral flanges at base of mid-legs. Abdomen with segments 2-7 hyaline white with a double row of small black transverse dashes dorsally on the posterior margin of each segment, mostly clearly defined on segments 4-7; segments 8-10 opaque, whitish, with the posterior half of 8 and most of 9 and 10 shaded with bright brown dorsally. Setae, forceps and legs pale, whitish, the forelegs somewhat tinged with smoky, the fore and mid femora with a faint ruddy median band which is generally lacking or extremely faint on the hind pair; all femora with ruddy apical spot; tip of fore tarsus blackish; first fore tarsal joint almost two-thirds the length of second. Wings hyaline without apical shading and with fine black

veins and crossveins, the latter slightly thickened in costo-apical region. Length of body 7 mm., of forewing 8 mm.

Female. Scarcely separable from *terminatus;* whitish with the head behind the ocelli largely orange-red shading into yellowish at bases of ocelli; antennae ringed at bases with ruddy-brown; the abdomen appears yellow due to the underlying egg-masses and the black subdorsal dashes are more pronounced than in the males.

Holotype—♂, Queenston, Ont., July 28, (G. S. Walley); No. 2229 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—2♂, same data; 2♂, 1♀, Niagara Glen, July 27; 6♂, Niagara Falls, July 29, 30, all collected by G. S. Walley.

The species was taken along with typical *pulchellus* from which it may be distinguished by the presence of the two dark, subdorsal dashes on abdomen, the lack of stigmatal black dots, the much finer crossveins on primaries, which lack all trace of apical shading, and the slightly longer first joint of the male foretarsus. It is very close to *terminatus* Walsh which is a ruddier species with a much shorter first foretarsal joint and a continuous brownish band on the posterior margins of abdominal segments with only traces of the dark transverse dashes. Walsh possibly had both forms included in his series of *terminatus* as they both occur in Illinois.

Ecdyonurus ruber n. sp.

Male. Head in front of antennae pale whitish with slight ruddy marks on vertical carina; vertex of head deep ruddy-brown. Thorax dorsally deep brown with slight ruddy tinge; pleura whitish with strong ruddy tinges anterior to the wing-bases, extending down to the bases of the midlegs, and with fainter pinkish shades below wing-bases; sternum pale ochreous slightly tinged with yellowish; the scutellum of the mesonotum is tipped with whitish and the lateral areas beneath the scutellum, as well as the anterior projection of the metanotum, are also pale. Abdomen with segments 1-7 pale hyaline with a slight smoky tinge and with narrow black bands dorsally on posterior margin of each segment; a row of blackish stigmatal dots on each side of segments 3-7; segments 8-10 dorsally deep ruddy-brown, ventrally opaque, whitish; setae pale, narrowly ringed with purple-brown; forceps pale, slightly infuscated apically. Forelegs dull amber-colored, hinder pairs pale yellowish-white, each femur with a median purplish band and tipped with the same color, apex of tibia and apices of tarsal joints faintly, blackish; foreleg with coxa largely ruddy, two hind pairs of legs with small reddish spot on coxae; first joint of foretarsus rather more than half the length of second joint. Wings hyaline with faint ruddy tinge before apex of primaries; veins and crossveins all dark, the latter slightly thicker than the longitudinal veins. Length of body 7 mm.; of forewing 8 mm.

Female. Pale whitish-ochreous with only slight ruddy tinges on thorax and abdomen but with the dark markings as in the male sex. Head white with rusty brown shading at base of antennae, behind each ocellus and broadly on the vertex; a slight dark mark on the vertical carina. The abdomen generally appears bright yellow, due to the underlying egg-masses. Legs all pale with maculation as in male sex.

Holotype—♂, Ottawa Golf Club, Que., July 31, (G. S. Walley); No. 2230 in the Canadian National Collection, Ottawa.

Allotype—♀, same locality and collector, July 21.

Paratypes—20 ♂, 7 ♀, taken in the same general locality by various members of the Entomological Branch Staff during July and August.

The species is close to *pulchellus* but is distinguished in the male sex by its ruddier color, especially on the anterior portion of the pleura; the white on the scutellum is restricted to the posterior margin and the abdominal segments 1-7 are not as pure white as in *pulchellus* but are faintly tinged with smoky. From *terminatus* Walsh it is separable by the presence of stigmatal dots on the abdomen, the much longer first joint of the male fore-tarsus, the banding of the hind femur, and apparently by the color of the eyes in the living males which, according to my notes, are pale slaty-blue or pearly-gray, whilst in *terminata* they are light yellow-green. The species is common in the Ottawa region; I have taken it on the Rideau river in June but in the Ottawa Valley it has not appeared until July and August. It also occurs on the St. Lawrence, specimens being before me from Lachine and Laprairie. It is probably this species which was misidentified by Banks as *terminatus* Walsh (1910, Can. Ent., XLII. 200) and by Clemens as *luridipennis* Burm. (1915, Cont. Can. Biology, 139).

Considerable confusion has existed in the literature regarding the identity of *pulchellus* Walsh and *terminatus* Walsh. Walsh's collection is destroyed but in the Museum of Comparative Zoology at Cambridge there still exist male specimens of the original series of both species sent by Walsh to Hagen: as these agree excellently with Walsh's descriptions I propose to regard them as types. From a study of these I am led to the conclusion that Banks in his article on the Eastern species of *Heptagenia* (1910, Can. Ent., XLII, 200) has misidentified both species; his *pulchellus* is probably *integer* McD. whilst his *terminatus* is closer to the true *pulchellus,* but probably *ruber* McD. The true *terminatus* is a rather ruddy appearing species with no stigmatal dots nor banding on the mid and hind femora (occasional traces on midfemora) and with a distinctly shorter first joint of the male foretarsus as compared with *pulchellus;* this joint is considerably less than one half (generally about one third) of the second joint. *Pulchellus* has a blacker thorax, due to the lack of ruddy shades, but the scutellum is broadly white, not merely white-tipped; the dark stigmatal dots are present, the hind femora are banded and the first joint of the foretarsus is fully one half of the second one (rather over than under). Our only Canadian records are from the Niagara River. *Placita* Banks, described from a unique male from Sacandaga River, N. Y., now in alcohol in the Museum of Comparative Zoology, can scarcely be separated from *terminatus;* it probably represents a slightly darker Eastern race. It is common in the Ottawa and St. Lawrence Valleys.

Heptagenia walshi n. sp.

Male. Head deep brownish with a pale yellow transverse band in the antennal region; thorax dorsally deep black-brown with slight paler shades in the region of the scutellum; pleura largely dark; sternum light yellowish. Abdomen with segments 1-6 pale hyaline with a slight smoky tinge and with narrow dark brown transverse bands on posterior margin of segmens 1-6 dorsally; segments 7-10 opaque, dorsally deep brown, ventrally light ochreous; setae and

forceps pale. Legs light yellow, all femora with a fine dark apical streak; fore tibia tipped with brown; fore tarsi slightly smoky; first joint about one fourth the length of second. Wings hyaline with a faint milky tinge on basal half and along costa of primaries; veins and crossveins blackish; costal crossveins before the bulla and those below the bulla broadly margined with black; there is also a slight black margining on some of the crossveins near apex of wing and a slight tinge at the fork of the median vein. Length of body 6 mm.; of forewing 6 mm.

Holotype— ♂, Walsh, Ont., July 10, (G. S. Walley); No. 2231 in the Canadian National Collection, Ottawa, Ont.

The species belongs in the *maculipennis* group and is close to *juno* McD. from which it can be distinguished by its dark thorax and slight smoky tinge to the anterior abdominal segments; the entire foreleg (as far as can be judged) is much shorter than that of *juno*.

I name the species in honor of B. D. Walsh who did so much pioneer work in this order in Illinois.

Heptagenia minerva McD.

A study of long series of specimens from the Ottawa region convinces me that two species have been mixed under this name; in the type series the holotype and allotype belong to the same species but some of the paratype material belongs to a species which I characterize below. Typical *minerva* has no ruddy shading on the vertex of the head in either sex; the thorax is pale with the exception of a geminate brown medio-dorsal line on anterior portion of mesonotum and two small black dots laterally at the base of the scutellum (this rather characteristic feature was omitted in the original description); the fore femora, at least, show a fine ruddy streak in the median area as well as the apical streak, and the abdominal maculation is reduced to a series of dark lateral dashes or small triangular patches.

Heptagenia aphrodite n. sp.

Very similar to *minerva* McD. but with darker thorax, no spots at base of scutellum and more extended dark abdominal markings; the median ruddy streak of the femora is lacking and the head (especially in ♀) shows ruddy shading on vertex and between the lateral ocelli and the eyes.

Male. Head pale yellow, tinged with black on anterior and posterior areas and with orange or ruddy shading at base of ocelli and between these and the eyes. Pronotum pale yellow, tinged with black laterally; mesonotum pale smoky-brown, the lateral area anterior to the wings more or less light ochreous giving the impression of a broad dark mediodorsal stripe which contains a faint pale central line; scutellum pale whitish, the area before it, however, being noticeably smoky brown; pleura and sternum light yellowish with a broad blackish stripe across the former as in *minerva*. Abdomen with segment 1 deep brown except the anterior margin which is pale ochreous, segments 2 and 3 with broad dark brown lateral semi-rhomboidal patches with concave lateral edges; these patches do not quite attain the anterior margin of segments but are joined by a narrow dark band on the posterior margin of each segment leaving a more or less hemispherical, pale ochreous dorsal patch, larger on 3 than on 2, and lateral

areas of the same pale color; on segments 3-6 the dark lateral patches are reduced in size and semi-triangular in shape, the pale areas being correspondingly larger, segments 7-10 dorsally deep black-brown. Ventrally the entire abdomen is pale yellowish; setae and forceps pale. Legs pale yellowish, the fore tibiae and tarsi tinged with smoky; the femora show a faint dark apical streak only (generally confined to the fore femora). Wings as in *minerva*.

Female. Largely pale ochreous; the head shows ruddy shading in the vicinity of the ocelli as in the ♂; the thorax is pale with the exception of a geminate dark brown streak on the anterior portion of mesonotum; the dark lateral abdominal markings are somewhat reduced but sharply defined. Length of body 6 mm.; of forewing 7 mm.

Holotype— ♂, Ottawa Golf Club, July 30, (J. McDunnough); No. 2233 in the Canadian National Collection, Ottawa.

Allotype— ♀, same locality and collector, but captured Aug. 6.

Paratypes—26 ♂, 17 ♀, from same general locality taken on various dates during late July and August by Messrs. Ide, Walley and McDunnough.

The species is intermediate in some respects between *minerva* and *hebe*, the latter species having a still darker thorax and in the male more limited pale markings on the abdomen. The male genitalia show a more prominent apical projection in the penes than is found in *minerva* and the apical spines are stronger but not as strong as in *hebe*, (vide Can. Ent., LVI, 122, Plate III, fig. 6); the female is very close to that of *hebe* but in this latter species the ruddy shades on head are generally confined to the corner of the eye, the thoracic geminate streak is either entirely lacking or represented by a diffuse shade and the abdominal markings are less black and rather diffuse and poorly defined.

In this whole group I have noticed that specimens left too long in the killing-bottle or subjected to moisture after death are liable to turn purple-black and confusion of species is the result with such specimens, unless carefully examined.

Genus **Rhithrogena** Eaton.

After an examination of specimens of the type of this genus, *semicolorata* Curt., I am following Eaton in placing our North American species of the *brunnea* group in *Rhithrogena*. Our species are all more or less unicolorous dark brown as in the genotype and show the same dark streaks on the femora; the male genitalia are of essentially the same rod-like type without the centrally placed stimuli of *Heptagenia* and the only difference I can point to is the tendency to anastomosis of the costo-apical veins in our American species, these being typically simple in European species; I can hardly regard this, however, as of generic value. The following species fall into this genus: *flavianula* McD., *brunnea* Hag. (*hageni* Eat.), *morrisoni* Banks, *impersonata* McD., *undulatus* Banks and *jejuna* Eaton (*fusca* Wlk.); *robusta* Dodds may also be included, but the species is at present unknown to me. Of the above mentioned forms the first three show a lateral spine at the base of each penis which is wanting in the latter three species

The species recorded and figured by Dodds (1923, Trans. Am. Ent. Soc., XLIX, 104, fig. 13) as *hageni* Eaton is not the true species; an examination of the type at Cambridge, Mass., showed me that Eaton's figure of the ♂ genitalia

was good and that the penes are strongly bent outward apically; *morrisoni* Banks is much closer to *brunnea* than is Dodds' Colorado species. I have a good series of Dodds' form from southern Alberta and Colorado and as it is apparently without a name I describe it as follows.

Rhithrogena doddsi n. sp.

Male. Head deep brown with a paler band in the antennal region; thorax brown, the scutellum slightly paler; the pleura largely light ochreous. Abdomen brown dorsally with lighter intersegmental rings, dull ochreous brown ventrally, forceps and setae smoky-brown. Legs dark amber-brown, the fore tibiae and tarsi smoky-brown; all femora show a dark streak in the basal half. Wings hyaline with fine dark brown venation, the costal cross-veins being obsolescent in the basal half of wing. Male genitalia as figured by Dodds (*op. cit.* fig. 13). Length of body 10 mm.; of forewing 11 mm.

Female. Essentially as in ♂, but head shaded with ruddy and mesonotum rather paler.

Holotype—♂, Waterton Lakes, Alta., July 6, (J. McDunnough); No. 2234 in the Canadian National Collection, Ottawa.

Allotype—♀, same locality and collector, July 8.

Paratypes—8♂, same locality and collector, July 6, 8, 9, 11, 13.

Close to *morrisoni* Banks but this shows the outcurved apex of penis, as does *brunnea*, and has, further, the large basal cross-vein on forewing deep black. Coloradan specimens are rather larger than my Alberta type-series and show a dark costo-apical shade but I can detect no further differences.

A PRELIMINARY REVISION OF THE CAMPOPLEGIINAE IN THE CANADIAN NATIONAL COLLECTION, OTTAWA.

BY HENRY L. VIERECK,
Ottawa, Ont.

(Continued from page 182)

Campoplex (Holocremnus Foerster).

(*Limnerium*) *Campoplex* (*Holocremnus*) *lophyri* Riley.
(*Olesicampa*) *Campoplex* (*Holocremnus*) *alaskensis* Ashmead.
(*Campoplex*) (*Holocremnus*) *metacomet* Viereck—*Zaplatystoma metacometi* Viereck.

Campoplex (Ischnoscopus) alterus n. sp.

Related to *C.* (*I.*) *taeniatus* Viereck.

Female. Length 5 mm.; black, scape and pedicel mostly black, mandibles mostly yellow, palpi pale stramineous, tegulae yellowish with a nearly colorless margin, fore coxae and trochanters whitish like the mid trochanters, mid coxae and fore and mid femora stramineous, fore tibiae stramineous with their extensor surface whitish, fore tarsi stramineous, mid tibiae stramineous, darkened near base and at apex, mid basitarsi stramineous, hind coxae and femora reddish stramineous, their trochanters yellowish, hind tibiae yellowish on their flexor surface, elsewhere pale yellowish at extreme base and in the middle, black at apex and near base, hind basitarsi mostly blackish, abdomen black with a yellowish plica; areola poorly defined, obtuse-angled at base, finely sculptured like the petiolarea with which it is confluent, petiolarea defined laterally by well developed carinae;

abdomen obliquely truncate, sheaths of the ovipositor apparently twice as long as the truncature.

Holotype—♀, Ottawa, Ont., (W. H. Harrington); No. 1692 in the Canadian National Collection, Ottawa.

Campoplex (Ischnoscopus) mitralis n. sp.

Related to *C. (I.) alterus* Viereck.

Female. Length 5 mm.; compared with the original description of *C. (I.) alterus* Vier. this differs as follows. Palpi whitish, coxae black, fore and mid pair and all distal trochanters yellowish, hind proximal trochanters black with a pale apical margin, all femora reddish, fore and mid tibiae reddish with their extensor surface mostly whitish, fore and mid tarsi stramineous, the extensor surface of the former whitish and the basitarsi of the latter mostly whitish, hind tibiae reddish on their flexor surface, elsewhere whitish at base and in the middle, black near base and at apex, hind tarsi black with the basal half of their basitarsi whitish; areola acutely angled at base, longer than wide, its long sides parallel, confluent with the petiolarea and nearly as coarsely sculptured as the latter; abdomen truncate, sheaths of the ovipositor not much longer than the truncature.

Holotype—♀, Fort Norman, McKenzie River, Aug. 6, 1922, (C. H. Crikmay); No. 1693 in the Canadian National Collection, Ottawa.

Campoplex (Ischnoscopus) truncatellus n. sp.

Related to *C. (I.) mitralis* Viereck.

Female. Length 7.5 mm.; compared with the original description of *C. (I.) alternus* Vier. this differs as follows. Palpi yellowish, fore coxae yellowish, brown and blackish at base, mid coxae reddish, yellowish at apex, fore and mid proximal and all distal trochanters pale yellowish, mid femora reddish, extensor surface of fore and mid tibiae mostly pale yellowish, mid tibiae elsewhere dark stramineous, hind coxae black, hind proximal trochanters black with a pale apical margin, hind femora faintly blackish at apex, hind tibiae yellowish and reddish on their flexor surface, elsewhere whitish at base and in the middle, black near base and at apex, hind tarsi black save for the basal half of their basitarsi which is mostly whitish, plica blackish or brownish with more or less yellowish margins; areola well defined, truncate at base, a little longer than wide, transversely costate like the petiolarea with which it is confluent, sheaths of the ovipositor apparently a little shorter than the truncature of the abdomen.

Holoype—♀, Trenton, Ont., June 12, 1904, (Evans); No. 1694 in the Canadian National Collection, Ottawa.

Campoplex (Ischnoscopus) vinalis n. sp.

Related to *C. (I.) truncatellus* Viereck.

Female. Length, 7 mm.; black, antennae black throughout, mandibles mostly yellow, palpi pale stramineous, tegulae pale stramineous, fore coxae stramineous, blackish at base, mid coxae black, brownish stramineous at and near base, hind coxae black, fore trochanters yellowish, mid trochanters yellowish excepting their proximal joint which is black at base, fore femora dark stramineous, their tibiae and tarsi pale stramineous, mid femora reddish, their tibiae and tarsi dark stramineous, their tibiae with the extensor surface yellowish at base and in the middle, dark near base and at apex, apical joint of fore and mid tarsi blackish,

hind proximal trochanters black with a dark stramineous apical margin, their distal trochanters dark stramineous, hind femora reddish, their tibiae stramineous, with the extensor surface whitish at base and blackish near the base, and at apex, hind tarsi blackish, their basitarsi mostly stramineous, their second tarsal joint pale at base, abdomen black with the third and fourth tergites reddish laterally, plica dark yellowish; eyes converging anteriorly; petiolarea nearly as in *truncatellus*, the areola however not transversely costate being instead rather finely wrinkled; abdomen squarely truncate, its sheaths apparently one and one half times as long as the truncature.

Holotype—♀, Hemmingford, Que., June 19, 1917, (J. I. Beaulne); No. 1695 in the Canadian National Collection, Ottawa.

Campoplex (Ischnoscopus) angustus n. sp.

Related to *C.* (*I.*) *vinalis* Viereck.

Female. Length 4 mm.; black, scape and pedicel yellow, partly black behind, mandibles mostly yellow, palpi pale stramineous, tubercles and tegulae pale yellowish, fore coxae and all trochanters pale yellowish, the coxae stramineous at base, mid coxae stramineous, yellowish at apex, hind coxae reddish, fore femora dark stramineous, their tibiae and tarsi pale stramineous, the tibiae with their extensor surface whitish yellow, mid femora darker stramineous than the fore femora, mid tibiae stramineous, their extensor surface mostly whitish yellow, mid tarsi whitish to stramineous with the apical joint blackish, hind femora reddish, black at apex, flexor surface of their tibiae stramineous, elsewhere whitish at base and in the middle, black near base and at apex, hind tarsi black, paler brownish at apex of the joints with the basal half of the basitarsi mostly whitish, abdomen black, apical half of second tergite dark stramineous, all but base of third, sides of the fourth and fifth and apparently all of the following tergites, reddish, plica yellowish; areola almost acute angled at base, finely sculptured, confluent with the slightly concave, nearly transversely costate petiolarea; abdomen truncate, the sheaths of the ovipositor apparently not longer than the apical truncature.

Holotype—♀, Aylmer, Que., July 20, 1924, (C. H. Curran); No. 1696 in the Canadian National Collection, Ottawa.

Paratype—♀, Hemmingford, Que., July 6, 1925, E. M. (G. H. Hammond); cocoon black and gray, 4x2 mm.

Campoplex (Ischnoscopus) largo n. sp.

Related to *C.* (*I.*) *angustus* Viereck.

Female. Length 5 mm.; compared with the original description of *C.* (*I.*) *alterus* Vier. this differs as follows. Antennae wanting, palpi whitish, fore and mid coxae stramineous, virtually concolorous with the rest of the fore and mid legs, fore and mid trochanters and extensor surface of fore and mid tibiae whitish yellow, hind proximal trochanters dark stramineous, hind femora blackish at apex, hind tibiae reddish on their flexor surface, basal two-thirds of the extensor surface yellowish, apical edge of first tergite, apical two-thirds of second, mostly all of third and most of sides of the following tergites yellowish; basal area represented by a carina, areola nearly angulate at base, finely reticulated, confluent with the petiolarea which is slightly more sculptured; abdomen truncate, sheaths of the ovipositor concealed.

Holotype—♀, Royal Oak, B. C., July 24, 1917, (W. Downes); No. 1697 in the Canadian National Collection, Ottawa.

Campoplex (Ischnoscopus Foerster)..

After the last category should come—

Areola and petiolarea not confluent ..... *paenerivalis* Viereck.
Areola and petiolarea confluent ..... *hullensis* Viereck.
(*Idechthis*) *Campoplex* (*Ischnoscopus*) *paenerivalis* Viereck.
(*Neonortonia*) *Campoplex* (*Ischnoscopus*) *hullensis* Viereck.

Campoplex (Hyposoter) fuscitarsatus n. sp.

Presumably related to *C.* (*H.*) *basilaris* Provancher.

Female. Length 6 mm.; black, antennae black with the scape and pedicel brownish at apex, basal half of mandibles mostly yellow, palpi nearly whitish, tegulae half yellow, half nearly colorless, fore coxae stramineous, yellowish at apex, mid coxae reddish, yellowish at apex, hind coxae black, fore and mid trochanters yellowish, hind proximal trochanters blackish at base, brownish at apex, hind distal trochanters dark stramineous, rest of fore legs stramineous, mid and hind femora reddish, rest of mid legs stramineous, hind tibiae reddish, extreme base and extreme apex blackish, hind tarsi blackish, the first joint pale at extreme base, abdomen black with a yellowish plica, second and third tergites, apically and laterally obscurely reddish; propodeum slightly concave, areola broadly truncate at base, confluent with the petiolarea, areola and petiolarea transversely costate; abdomen fusiform, the exserted portion of the sheaths of the ovipositor nearly half as long as the abdomen.

Holotype—♀, Aylmer, Que., August 2, 1924, (C. H. Curran); No. 1700 in the Canadian National Collection, Ottawa.

Campoplex (Hyposoter) erythrinus n. sp.

Presemably related to *C.* (*H.*) *rubiginosus* Cushman.

Female. Length 9 mm.; reddish, head black, clypeus stramineous, yellowish along the anterior margin, mandibles mostly yellow, palpi yellowish, scape reddish, pedicel brownish, flagel black, brownish toward apex, tegulae yellowish in part, mostly nearly colorless, coxae reddish, fore pair yellowish at apex, fore trochanters yellowish, mid trochanters yellowish and reddish, hind proximal trochanters blackish and reddish, the apical margin yellowish, hind distal trochanters and all femora reddish, tibiae reddish, the fore and mid pair with their extensor surface yellowish, the hind pair slightly blackish at base and apex, fore and mid tarsi yellowish, their apical joint brownish, hind tarsi with the first and second joints mostly blackish brown, yellowish at base and apex, the third and fourth joints comparatively pale, the apical joint reddish; areola acutely angular at base, finely reticulated, confluent with the rugose petiolarea which is slightly concave; abdomen truncate at apex, its sheaths a little longer than the apical truncature.

Holotype—♀, St. Louis, Sask., July 25, 1898, (E. Coubeaux); No. 1699 in the Canadian National Collection, Ottawa.

Campoplex (Hyposoter) vancouverensis n. sp.

Related to *C.* (*H.*) *erythrinus* Viereck.

Female. Length 7 mm.; black, scape and pedicel mostly brownish in

front, mandibles mostly yellow, palpi yellowish, tegulae yellow with a nearly colorless margin, coxae black, rest of fore and mid legs dark stramineous, hind proximal trochanters black with a pale apical margin, hind distal trochanters dark stramineous, hind femora and tibiae, reddish, the tibiae darkest, hind tarsi blackish, abdomen blackish with a narrow pale yellowish or stramineous margin to the tergites, plica yellowish; inner edge of eyes parellel; areola narrowly truncate at base, nearly acutely angled, apparently wider than long, finely sculptured, confluent with the transversely costate petiolarea; abdomen fusiform, exserted portion of sheaths of the ovipositor a little more than half as long as the abdomen.

Holotype—♀, Vancouver, B. C., June 12, 1903; No. 1701 in the Canadian National Collection, Ottawa.

Campoplex (Hyposoter) convergens n. sp.

Related to *C. (H.) vancouverensis* Viereck.

Female. Length, 6 mm.; compared with the original description of *C. (H.) vancouverensis* Vier. this differs as follows. Scape and pedicel black, their apical edge brownish, fore coxae black, yellowish at apex, fore trochanters pale stramineous, mid proximal trochanters black at base, yellowish at apex, mid distal trochanters stramineous, apical joint of fore and mid legs blackish, hind distal trochanters reddish, hind basitarsi brownish at base, abdomen black or blackish throughout above, plica mostly yellow; inner edge of eyes converging anteriorly; abdomen truncate, sheaths of the ovipositor nearly twice as long as the apical truncature.

Holotype—♀, Cranbrook, B. C., May 16, 1922, (C. B. D. Garrett); No. 1702 in the Canadian National Collection, Ottawa.

Paratype—2 ♀♀, Banff, Alta., June 9, Sept. 15, 1922, (C. B. D. Garrett).

Campoplex (Hyposoter) acutus n. sp.

Related to *C. (H.) vancouverensis* Viereck.

Female. Length 8 mm.; compared with the original description of *C. (H.) vancouverensis* Vier. this differs as follows. Scape and pedicel black, obscurely brownish at apex, base of first, second and third joints of hind tarsi, pale, hind basitarsi mostly brownish, abdomen black above, the apical margin of the tergites obscurely stramineous; areola acutely angular at base, finely reticulated, nearly as wide as long, confluent with the rugulose petiolarea; abdomen truncate at apex, sheaths of the ovipositor at least three times as long as the apical truncature.

Holotype—♀, Oliver, B. C., May 31, 1923, (C. B. D. Garrett); No. 1698 in the Canadian National Collection, Ottawa.

Campoplex (Hyposoter) truncatus n. sp.

Related to *C. (H.) acutus* Viereck.

Female. Length 5 mm.; black, antennae black throughout, mandibles black at base, dark stramineous toward apex, palpi dark stramineous, tegulae blackish, coxae black, trochanters mostly black, rest of fore and mid legs stramineous excepting the small joints of fore and mid tarsi which are mostly darkened, brownish or blackish, hind legs colored like the mid legs but a little darker, abdomen black, plica partly yellowish; areola rounded at base, nearly half as

wide as the propodeum, finely sculptured with some wrinkles, confluent with the transversely, nearly lineate, petiolarea; abdomen obliquely truncate, the sheaths of the ovipositor nearly twice as long as the truncature.

Holotype—♀, Bernard Harbour, N. W. T., July 18, 1915, (Canadian Arctic Expedition 1322); No. 1703 in the Canadian National Collection, Ottawa.

Campoplex (Hyposoter) plesius n. sp.

Related to *C. (H.) diversicolor* Viereck.

Female. Length 6 mm.; black, scape and pedicel dark stramineous in front, clypeus along the anterior edge with a stramineous border, mandibles mostly yellow, palpi yellowish, fore and mid legs including coxae mostly stramineous, their trochanters and tarsi at least partly yellowish, hind legs including coxae reddish excepting their tarsi which are blackish and their tibiae near the base and at apex where they are black, the reddish part of hind tibiae darker than their femora, abdomen black, apical edge of tergite obscurely brownish stramineous, plica brownish with yellowish margins; areola rounded at base, wider than long, confluent with the petiolarea, areola and petiolarea nearly uniformly rugulose; abdomen clavate, sheaths of the ovipositor exserted but the exserted portion as long as the third tergite.

Holotype—♀, Sudbury, Ont., 1890, No. 1704 in the Canadian National Collection, Ottawa.

(To be continued)

SEVERAL NEW SPECIES OF PSAMMOCHARIDAE (HYMENOPTERA).

BY NATHAN BANKS,
Cambridge, Mass.

In the course of identification work the following descriptions have been made of new species. The types are in the Museum of Comparative Zoology.

Anoplius confraternus sp. nov.

♀ Black, moderately hairy; clypeus broad; no line above antennae; ocelli in a very broad triangle (as in *A. similaris*), the anterior ocellus very much larger than the laterals; face slightly narrowed above; vertex from in front scarcely convex; third antennal joint fully one and a half times as long as the fourth; pronotum almost angulate behind; metanotum rounded, without median furrow or depression, behind almost truncate; legs rather strongly spined, front basitarsus with the three outer spines a little longer than in *A. illinoiensis*, but not as long nor curved as in a *Psammochares;* hind spurs with the long one more than one half of basitarsus; abdomen slightly depressed at base, hairy at tip. Wings uniform dark; basal vein interstitial with the transverse; second and third submarginals subequal, the third narrowed above; first recurrent vein near tip of cell, second recurrent at middle of cell; marginal cell about its length from tip of wing, outer side straight. Length 12 mm.

From Ridgeway, Ontario, 24 July (Van Duzee). Much like *A. illinoiensis*, but ocelli readily separate it; from *similaris* separated by absence of a furrow on metanotum, and on face.

Priocnemis decepta sp. nov.

In general appearance it is like *Cryptocheilus terminatus;* there are however

no spines under the last joint of the hind tarsi, and in structure it is not far from *P. fortis,* having rather short heavy legs, with short spines on the hind tibiae, above the spines and serrations are more distinct than in *P. fortis.* The clypeus is only slightly, broadly emarginate; eyes extending a little below the upper edge of clypeus; the lateral ocelli as near to eyes as to each other, pronotum rounded behind; third antennal joint a little longer than the fourth, the antennae arising just above clypeus; propodeum moderately hairy and the posterior part strongly transversely rugose, especially on the sides. Marginal cell acute at tip, first recurrent ends near middle of the cell, the second ends before middle of cell, basal vein and transverse widely separate, in hind wing the veinlets are interstitial on cubitus.

From Fedor, Lee Co., Texas, Nov. (Birkmann).

Cryptocheilus carinatus sp. nov.

Of the general appearance, and same general body characters of *C. terminatus;* the wings, however, are more broadly darkened at tip. It is separated from *terminatus,* and allied forms, by the clypeus being wholly entire, not a trifle emarginate, and the male subgenital plate has a strong median carina for its entire length, and the hairs on the margin of the plate are two to three times as long as those of *C. terminatus.*

From Orman Dam, South Dakota 29 July (Severin).

Cryptocheilus severini sp. nov.

Also appearance very close to *C. terminatus,* the general characters of body about the same; the clypeus is more deeply and more narrowly emarginate; the propodeum slopes less abruptly; the subgenital of the male differs in that the triangular basal area is here very long, reaching nearly to the tip of the plate, the sides convex, giving a very different shape to the area; this area is sharply defined by lateral ridges as is that of *C. terminatus,* and the marginal hairs are short as in *terminatus.*

From Newell, South Dakota, 28 June (Severin).

Cryptocheilus birkmanni sp. nov.

Resembles closely *C. terminatus* Say, the clypeus however in both sexes is much less emarginate, only broadly, shallowly so in the male and scarcely at all in the female; the lateral ocelli are but little farther from the eyes than from each other (in *terminatus* much farther). In the male the subgenital plate shows a faint median carina and basad of it an ill-defined triangular area, not snarply marked as in *terminatus.*

From Fedor, Lee Co., Texas, May (Birkmann), and Galveston, Texas, (Brues).

Pepsis sayi sp. nov.

In general similar to *formosa,* with pale tips to the wings, the dark before it however, not very distinct; it differs in that bases of the wings are quite broadly black, fully as much as in *boquei.* The clypeus is rather angularly emarginate in front, not quite as deeply as in *formosa;* the antennal joints are about as in that species, in the female the third is a trifle shorter; the head is rather more hairy above than in *formosa.* The prothorax has stiff hair above. Venation similar to *formosa,* the third cubital projects beyond the radial in both specimens.

the second recurrent meets the cell plainly before the middle and beyond the basal third. Femora of front legs not hairy below, tibia of third legs without curved hairs between spines, apical spurs as in *formosa*. Length 28 mm., expanse 57 mm. Female from Palmerlee, Arizona, (Biederman); male from San Emigdo Canon, Kern Co., Calif. (Grinnell).

In my table (Ann. Ent. Soc. Amer. XIV, 22) it goes to 13 and differs from all there by the dark wing-base; from *cinnabarina* by lack of red in wing. The female would run to No. 18; here the lack of red and pale wing tip separates it. The male subgenital plate is similar to *formosa*, but the median tooth is higher, and at base separated by its width from the apical ridge.

In Lucas table it runs to *nigrocincta* (p. 733), but this species is treated in the next section and nothing said of pale apical margins, moreover the antennae are longer than there indicated, and the third cubital is longer than in his figure 113; it differs from *thisbe* (my indentification) in broader head, longer hair, less red on wing, more black at wing-base, and less before the pale tips.

Mygnimia cressoni sp. nov.

This is what Cresson and others have called *M. ustulata* Dahlb. Dahlbom says "violaceo-atra," and it was from Mexico. There are several violaceous species in Mexico, but ours is black with little if any violaceous. The wings are yellowish to reddish, black at base and tip. The propodeum is wrinkled and hairy. The long spur of hind tibia is much less than one-half the length of the basitarsus; the front femur is long haired below, short haired above. In venation the first recurrent ends close to end of the second submarginal cell, the second recurrent is strongly sinuate and ends much before the middle of the third submarginal cell. Anterior ocellus less than diameter from the laterals, the distance between laterals is equal to about two-thirds distance of lateral to eye; in the male rather closer. In the male the ventral plate is plainly notched on apical margin (not in *hesperina*). Expanse about 40 to 60 mm.

From Texas, Kansas, New Mexico, and Arizona.

AQUATIC HEMIPTERA FROM MANITOBA.

BY LEONARD B. CLARK,
University of Manitoba.

The purpose of this note is to record the occurrence of the following aquatic Hemiptera from Manitoba. Though many of them have been collected from more than one locality, the records are altogether too meagre to make general statements regarding the local distribution of many of the species. Consequently, only one locality is given for each form in the hope that further opportunity for study of distribution may arise.

Of the twenty-eight species listed here, only eleven have previously been recorded from Manitoba. Most of these may be found in the various numbers of the "Canadian Entomologist."

The species have been recorded from other parts of Canada with two exceptions, namely, *Gelastocoris oculatus* (Fabr.) and *Buenoa margaritacea* Bueno. *Plea striola* has previously only been recorded from Como, Que. *Notonecta lutea* Mull. is listed here but only to complete the list of Notonectidae. The Manitoba record rests upon one individual collected by J. B. Wallis at Husavick, Man. in

1911 and has been previously recorded.

Many specimens were identified by comparison with those in the National Collection at Ottawa, while others were submitted to Dr. H. M. Parshley and J. R. de la Torre Bueno, both of whom I wish to thank for their help in identification. Dr. Drake kindly confirmed the identification of *G. comatus* Drake.

Fam. MESOVELIIDAE

Mesovelia mulsanti White—July 6, 1923. Arnaud Man.

Fam. HYDROMETRIDAE

Hydrometra martini Kirk.—July 20, 1923. St. Norbert Man.

Fam. GERRIDAE

Gerris remigis Say—July 1, 1922. Shoal Lake Man. (A. Mozley coll.) July 6, 1923. Arnaud.

Seems generally but sparingly distributed on the rapid gravel bottomed streams in southeastern Manitoba. One winged form was taken at Winnipeg, July 10, 1923, all others apterous.

Gerris marginatus Say—July 10, 1923. Winnipeg Man.

Very common on almost all pools throughout southern Manitoba.

Gerris comatus Drake—June 23, 1924. Winnipeg.

Gerris buenoi Kirk.—July 10, 1923. Winnipeg.

Abundant about Winnipeg.

Limnoporus rufoscutellatus Latr.

Very common from spring to autumn throughout Manitoba.

See: Riley, C. F. C. 1925. Ento. Record and Jour. of Variation for June.

Fam. VELIIDAE

Microvelia americana (Uhl.)—June 30, 1923. Grand Beach Man.

Rhagovelia obesa Uhl.—August 17, 1922. Lac du Bonnet Man.

Fam. SALDIDAE

Pentacora ligata (Uhl.)—August 25, 1923. Winnipeg Man.

Salda coriacea Uhl.—August 5, 1923. St. Norbert.

Saldula major (Prov.)—June 5, 1922. Winnipeg.

Fam. NOTONECTIDAE

Notonecta lutea Mull.—Husavick Man. 1911. (J. B. Wallis coll.)

N. irrorata Uhl.—August 24, 1923. Stonewall Man.

N. variabilis Fieb.—Sept. 29, 1924. Winnipeg.

N. undulata Say.

Common throughout central and southern Manitoba in temporary and small permanent pools.

N. insulata Kirby.—August 5, 1923. St. Norbert Man.

N. borealis B & H.—June 6, 1922. Selkirk Man.

Buenoa margaritacea Bueno.—August 5, 1923. St. Norbet.

Plea striola Fieb.—June 11, 1924. St. Norbert.

This form was taken later in the small pool in the plant physiology garden of the University of Winnipeg.

Fam. NEPIDAE

Nepa apiculata Uhl.—Sept. 22, 1922. Vita Man.

Ranatra fusca P. B.—Sept. 29, 1923. Winnipeg.
Ranatra americana Montd.—Sept. 29, 1923, Winnipeg.

These were so abundant in the pools of Catfish Creek that they were used for class-work.

Fam. BELOSTOMIDAE

Benacus griseus (Say).—August 5, 1922. Winnipeg.
Lethocerus americanus (Leidy.)—August 10, 1923. Winnipeg.
Belostoma flumineum Say—Common about Winnipeg in Catfish Creek.

Fam. GELASTOCORIDAE

Gelastocoris aculatus (Fabr.)—June 1, 1923. Red river at Selkirk Man.

FOUR NEW CANADIAN CHIRONOMIDAE.

BY G. S. WALLEY,
Ontario Agr. Coll., Guelph, Ont.

Tanypus fragilis n. sp.

Length 3 mm. *Male.* Head, basal joint of antenna and antennal plume yellowish; palpi brown. Dorsum of thorax uniformly brownish yellow appearing slightly pollinose when viewed obliquely. Scutellum yellowish; metanotum brownish. Pleura yellowish with obscure fuscous markings. Halteres white. Legs uniformly pale yellowish throughout except bases of coxae which are slightly darkened. Pubescence rather long and erect on front femora and the entire mid and hind legs; front tibia and tarsus with short appressed hairs; all tibiae with fine apical black spines. Wings with three fuscous bands situated as follows: an incomplete band at region of crossvein expanding posteriorly in anal region; apical portion of wing broadly fuscous; an irregular fuscous band equidistant from the two former bands. Crossvein darkened. Costal margin of wing with numerous hairs; cubitus forking slightly before the crossvein. Abdomen with segments 2 to 5 suffused with fuscous on basal two-thirds; segments 6 to 8 entirely darkened. Hypopygium yellow. Abdominal hairs long and golden yellow on tergites 2 to 5, and fuscous on tergites 6 to 8. Apical portion of basal section of genital claspers bearing a number of rather long golden yellow hairs. Claspers of male long and slender, uniformly tapering apically.

Holotype—♂, Ingersoll, Ont., Sept. 8, 1924, (F. G. Walley); No. 2201, in the Canadian National Collection, Ottawa.

This species resembles in some respects *T. carneus* Fab. and *T. apicalis* Walley but is without the dorsal thoracic stripes and with different wing fasciae from the former and lacks the dark leg bands of the latter.

Chironomus farinalis n. sp.

Length 9 mm. *Male.* Basal segment of antenna, front and palpi blackish Flagellum fuscous; antennal plume yellowish white. Frontal tubercles distinct. Thorax green conspicuously and heavily coated with white pollen so as to almost obscure three longitudinal fuscous vittae on the notum. Pleura greenish with fuscous vitta. Scutellum green; metanotum green on anterior third, blackish on apical two thirds and heavily pollinose except in region of a narrow transverse black line at union of metanotum and first abdominal tergite. Thoracic hairs whitish, inconspicuous. Wings hyaline, faintly whitish. Front femora yellowish green, darkened at apices; remaining joints of front legs fuscous. Front

tarsal joints 2, 3, 4, and apex of metatarsus bearing long fuscous hairs posteriorly. Mid and hind legs yellowish green, last four tarsal joints tending to become fuscous toward apices. Mid and hind tarsal hairs pale, erect. Abdomen uniformly green, the three apical tergites bearing a considerable amount of whitish pollen. Hypopygium dirty yellowish.

Female. Basal segment of antenna and flagellum except apical segment yellowish. Front tarsi without long hairs. Abdominal segments with transverse fuscous bands on basal two thirds. Otherwise as in male.

Holotype— ♂, Lethbridge, Alta., August 25, 1913, (E. H. Strickland); No. 2203, in the Canadian National Collection, Ottawa.

Allotype— ♀, Lethbridge, Alta., June 12, 1920, (Strickland).

Paratype— ♂, Lethbridge, Alta., June 25, 1922, (H. L. Seamans).

Chironomus ontario n. sp.

Length 5-6 mm. *Male.* Facial region dirty brownish yellow; palpi dark brown, basal joint one half length of sub-basal joint; apical joint slender. Antenna with large basal joint deep golden yellow; sub-basal joint somewhat expanded and creamy yellow; flagellum fuscous, with brownish plume. Vertex on either side behind eye with an irregular row of erect brownish hairs. Pronotum divided; dorsum of thorax dirty yellowish and irregularly fuscous, with dark fuscous vitta in front of the posterior calli. Pleura yellowish, infuscated, with darker vitta. Dorsal and pleural regions of thorax with whitish pollen except on vittae. Scutellum infuscated; metanotum yellowish suffused with fuscous anteriorly. Thoracic hairs brownish, most conspicuous on the scutellum. Halteres pale yellowish. Wings smoky, surface free from hairs except a few scattered ones along radius. All femora and tibiae fuscous, heavily coated with long dense fuscous hairs; bases of tibiae with narrow band of short, yellowish, appressed hairs; mid and hind tibia with strong apical black spine in front; tarsi slender, whitish yellow at base becoming deeper yellow toward apices. Tarsal hairs pale, sub-appressed. Abdomen yellowish, each tergite with a broad dark brown sub-apical band bearing long, dense, erect, blackish hairs. Band on first tergite divided. Yellowish interspaces between bands about equal in width to bands and without hairs but each with a patch of whitish pollen on either side. Apical two tergites usually entirely fuscous. Genital armature conspicuous; yellowish, suffused with fuscous.

Female. Differs from male only sexually and in having fuscous markings more pronounced, in some cases distinctly blackish.

Holotype— ♂, Ottawa, Ont., Aug. 11th, 1924, (G. S. Walley); No. 2204, in the Canadian National Collection, Ottawa.

Allotype— ♀, Ottawa Golf Club, Que., Aug. 1, 1924, (Walley).

Paratypes— ♂, Ottawa, Ont., Aug. 11, 1924, (F. P. Ide); ♂, Niagara Glen, Ont., July 27, 1925, (Walley); 4 ♀, Ottawa Golf Club, Aug. 14, 1924, (Ide); ♂, same locality, Aug. 13, 1924, (Ide); ♀, Aylmer, Que., Aug. 15, 1924, (Curran); ♀, Hull, Que., Aug. 12, 1924, (Curran).

Chironomus deflexa n. sp.

Length 4.5 mm. *Male.* Frontal region of head pale yellow; basal segment of antenna deep yellow, flagellum and plume brownish. Palpi fuscous, well developed, twice as long as height of head, apical segment two-thirds length of

basal segments. Ground color of thorax yellowish with fuscous vitta before the posterior calli and scutellum; pleura indistinctly marked with fuscous; scutellum yellow; metanotum suffused with brown. Thorax with whitish pollen between vittae. Halteres white. Wings hyaline; veins pale. Legs yellowish white with pale hairs. Front femora with narrow apical and broader sub-apical brown bands, the sub-apical band bearing behind several long hairs which point toward base of femur, i.e., in an almost reverse direction to the other hairs. Front tibia with basal brown band twice the width of apical femoral band. All tibiae and mid and hind femora narrowly brownish at apices. Abdomen slender, yellowish, paler toward base; abdominal hairs pale. Apical portion of lateral processes of hypopygium rather flattened.

Holotype— ♂, Ottawa, Ont., August 18, 1924, (G. S. Walley); No. 2202 in the Canadian National Collection, Ottawa.

A NOTE ON THE SYNONYMY OF CERTAIN SPECIES OF PHYSONOTA (COLEOPTERA).

BY NORMAN CRIDDLE,
Entomological Branch, Ottawa.

Field studies in the coleopterous genus *Physonota* have convinced me that there are two species in Manitoba, but it has not been possible hitherto to distinguish these correctly. A later study of the available literature seems to shed light upon the identity of the species involved, and as a result I believe some alteration in nomenclature will have to be made.

Physonota unipunctata was described by Say in 1824, Jour. Acad. Nat. Sciences Vol. III, p. 434. The description leaves little doubt that Say had before him the practically unicolorous, single-spotted species, which in Manitoba we find feeding upon *Monarda*. Cassididae, however, are very variable as to colour, and it is not surprising, therefore, to find occasional indications of an additional thoracic spot on either side of the median one, which might lead to the belief that this species merged into the next.

In 1838, Randall described another species in the Boston Journal of Natural History, Vol. II, p. 30, 1838-39, calling it *helianthi*, a name later consigned to the synonymy, where it still stands in Lengs' List.

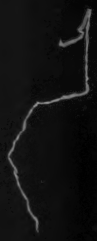
A third supposed species was described by Walsh as *quinquepunctata* in American Entomologist, Vol. II, 1869, and a fourth by Boheman as *septentrionalis* in 1862—Monog. Cassididarum, Holmiae, Norstadt IV. On comparing Randall's description with Say's it seems evident that he had not redescribed *unipunctata*, but that he had before him the second of our Manitoba species which we find feeding upon *Helianthus* as did Randall many years before. As was pointed out in the original description, *helianthi* differs from *unipunctata* in having three black spots on the prothorax. In addition to this nearly always constant character it may be recognised by its average larger size, larger and wider scutellum, less densely and more irregularly punctured elytra, the punctures becoming much more sparsely placed towards the anterior median line, and by the distinctly spotted elytra which is fairly well illustrated by Walsh under *quinquepunctata*. These spots consist of irregularly shaped yellow blotches on a dark background, the spot before the middle being much the largest. The elytra are also irregularly

but widely margined with the same color. The markings are much more contrasting in freshly killed specimens, as Randall points out, and on this account there is no difficulty in separating the species in life.

Walsh's *quinquepunctata,* which is figured, is apparently identical with our Manitoba species found feeding upon *Helianthus.* From *helianthi* it differs in the original description chiefly in the two additional distinct or coalescing spots in front of the central prothoracic spot. These supplementary markings are present in most of the specimens before me, but they are paler than the one immediately behind them, and they vary in different individuals in the density of pigmentation. It is highly probable that they were present in Randall's specimens, but were overlooked or unrecognisable in the fresh material he was dealing with. It is also significant that our Manitoba examples which have this frontal mark were as successful at defoliating wild sunflowers as were those described by Randall. The color of the under surface is variable. Montreal, Quebec, specimens are nearly black; those from Manitoba have the abdominal segments light on the posterior margins and in this character closely approach *unipunctata.*

In view of the above facts the synonymy would appear to be as follows:

P. unipunctata Say.
P. helianthi Randall.
Syn. *quinquepunctata* Walsh.

I have been unable to trace Boheman's species, but as it was described after *helianthi* it may be permitted to remain for the present as placed in the Check List without altering the status of the species dealt with above.

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